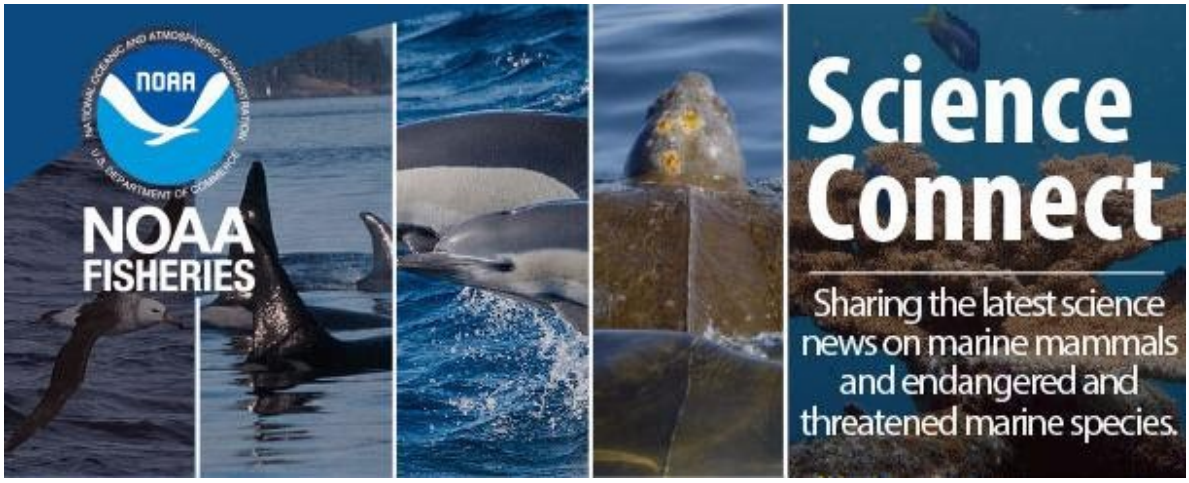
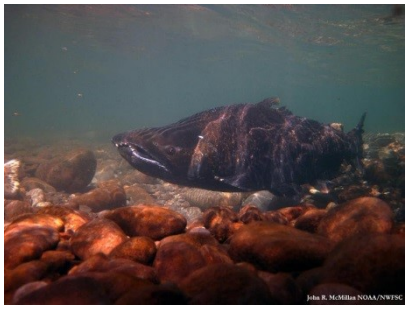


2017 **ISSUE #2**

Human-mediated evolution in Chinook salmon



Human activities along the Snake River have brought on environmental changes, leading to the alteration of juvenile life history strategies by Snake River Fall-run Chinook salmon. The salmon are now smolting as yearlings rather than subyearlings in larger proportions. However, it is unknown if this change in life history strategy is associated with genetics. In order to assess the heritability of this life history change, Waples et al. used juvenile growth and migration rates, genetic information, and life history modeling of Chinook salmon. Results suggest that altered juvenile life history traits could be partially explained by evolution. This has important implications for management as maintaining genetic diversity of run timing within the population is important to ensure that it can respond to environmental change.

Photo courtesy of NWFSC

Read More

Recent Publications

Behavior

Brewitt et al.
Hot eats and cool creeks: Juvenile Pacific salmonids use maintstem prey while in thermal refuge.
Read More

Environment, Climate, & Ecosystem Effects

Lehman et al.
Relationships between Chinook salmon swimming performance and water quality in the San Joaquin River, California.
Read More

Hayes et al.
Observations of steelhead in the California Current lead to a marine-based hypothesis for the half-pounder life history, with climate change implications for anadromy.
Read More

Shipping noise poses risk to baleen whales

Redfern et al. used shipping traffic data to estimate noise levels in waters off Southern California. They found multiple areas where elevated low-frequency noise overlapped with important blue, fin, and humpback whale feeding grounds and other areas expected to have higher whale densities. They also found that the Channel Islands National Marine Sanctuary contained noisy and quieter areas. Although the Sanctuary does not regulate noise, the quieter areas occur in designated ship avoidance zones that help reduce risks of grounding and pollution. This designation demonstrates that there may be effective strategies to mitigate the risks of noise to marine species. This research provides a framework that can be used to evaluate how shipping traffic affects acoustic environments and a tool to explore existing and future management strategies. Read a press release about this article here.

Photo courtesy of NOAA, Jessica Morten

Read More

Marine mammal predation on Chinook salmon

Predator-prey interactions are important controls on the size of animal populations, and these interactions between recovering species pose a conservation challenge. The recovery success of three protected pinniped species (California and stellar sea lions and harbor seals) and killer whales could be inhibiting the recovery of Chinook salmon in the Puget Sound due to predation. Using diet and bioenergetics models, Chasco et al. suggest that much of the Chinook mortality associated with predation occurs at early life stages and that there has been a significant increase in the consumption of Chinook salmon by pinnipeds from 1970 to 2015 (68 to 625 metric tons).

Photo courtesy of NOAA, Dave Withrow

Read More

Phillips et al.
Predator-prey interactions influenced by a dynamic river plume.
Read More

Arkoosh et al.
Alteration of thyroid hormone concentrations in juvenile Chinook salmon (*Oncorhynchus tshawytscha*) exposed to polybrominated diphenyl ethers, BDE-47 and BDE-99.
Read More

Ward et al.
Evaluating signals of oil spill impacts, climate, and species interactions in Pacific herring and Pacific salmon populations in Prince William Sound and Copper River, Alaska.
Read More

Population Studies

Waples and Anderson
Purging putative siblings from population genetic datasets: A cautionary view.
Read More

Tolimieri et al.
Population assessment using multivariate time-series analysis: A case study of rockfishes in Puget Sound.
Read More

Habitat shift in juvenile life stage of loggerheads

For loggerhead sea turtles, there is a limited understanding of how habitat use changes with life stage, which is necessary for the assessment of population trends and life history strategies for highly migratory species. Skeletochronology and stable nitrogen isotope ($\delta^{15}N$) patterns were used to assess habitat use of juvenile loggerhead sea turtles. Turner Tomaszewicz et al. found that juveniles did use different habitats (oceanic central North Pacific vs. neritic east Pacific) at different life stages. These two regions are highly variable with respect to food availability, energy requirements, and threats, which could affect life history parameters.

Photo courtesy of NOAA

Read More

Conservation

Taylor et al.
Extinction is imminent for Mexico's endemic porpoise unless fishery bycatch is eliminated.
Read More

Redfern et al.
Predicting cetacean distributions in data-poor marine ecosystems.
Read More

Complete List of Publications

About Us

The **Protected Species Science Branch (PSSB)** within the NOAA Fisheries Office of Science and Technology supports and provides the science necessary to inform management decisions. We do this by coordinating closely with the six Fisheries Science Centers, the Office of Protected Resources, and other NOAA Headquarters Offices.

This newsletter is intended to summarize the latest research on protected species from scientific publications that include one or more NOAA Fisheries authors. It will be distributed quarterly with alternate issues highlighting research from the East and West Coasts centers and offices.

Editorial Contacts: amber.bellamy@noaa.gov | mridula.srinivasan@noaa.gov